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| EXAMINER | |
|---|---|
| HOANG, HIEU T | |
| **ART UNIT** | **PAPER NUMBER** |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/767,227 | WELCH ET AL. | |
| | **Examiner** | **Art Unit** | |
| | HIEU T. HOANG | 2452 | |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on _12 June 2009_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1,2,4-7 and 21-24_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,2,4-7 and 21-24_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _7/29/09_.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. This office action is in response to the amendment filed on 06/12/2009.

2. Claims 1, 2, 4-7, 21-24 are pending.

### *Response to Amendment*

3. The 35 U.S.C. 101 rejection of claims 1-2, 4-7, 21, 22-24 has been withdrawn due to the amendment.

### *Response to Arguments*

4. Applicant's arguments have been fully considered but found unpersuasive.

5. First, applicant argues that the prior art does not teach or suggest determining whether another data stream from a particular data class that bandwidth was freed from a stream that just terminated. In traversal, Packer teaches, in col. 13 lines 45-60, col. 14 lines 7-10, that excess information rate EIR allows freed bandwidth from a terminated flow to be reallocated to other flows, until demand is satisfied meaning no need for more bandwidth for other flows, based on bandwidth availability. Packer also teaches isolation of bandwidth (col. 14 l. 18-26), for sharing unused bandwidth (bandwidth freed from a node using EIR) among siblings of a class.

6. Second, applicant argues that the prior art does not teach or suggest determining a plurality of acceptable transfer rate for a data stream. Applicant alleges that Shaffer teaches negotiates coding algorithms not transfer rates. In traversal, a coding algorithm in Shaffer is directly related to an *acceptable* bandwidth for a data stream (e.g., col. 5 l.

21-45, col. 6 l . 5-12). Therefore, it is maintained that Shaffer does teach negotiating among acceptable transfer rate.

7. Third, applicant argues that the prior art does not teach or suggest selecting a data stream to allocated freed bandwidth based on where the node of the class of the terminated data stream is. Applicant seems to argue separately that Vaid does not teach terminated bandwidth from a data stream and as such, Vaid does not teach the claimed limitation. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). That terminated data streams free bandwidth and the freed bandwidth is allocated as soon as it is freed is taught by Packer as in the latest office action. Vaid teaches allocating free bandwidth to siblings (closer nodes) of a class first before considering other further nodes in distant traffic classes in a bandwidth class hierarchy (fig. 3, col. 6 lines 47-52). It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer-Packer and Vaid in order to share unused bandwidth among siblings traffic flows first, then once siblings do not require more bandwidth, select another stream based on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree so that the unused bandwidth will be shared to other classes preferably close to the current class of the terminated flow, in order to efficiently

utilize the unused bandwidth and easily allocate unused bandwidth to closest classes first.

### *Claim Rejections - 35 USC § 112*

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites a device configured to do method steps. It is vague whether applicant intends to claim a device or the method steps done by the device (which are two different statutory classes), since there is no structural elements of the device recited in the body of the claim. Correction is required.

### *Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1, 2, 4-7, 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaffer et al. (6,757,277, hereafter Shaffer), in view of Packer et al.

(US 6,046,980, hereafter Packer), further in view of Vaid et al. (US 6,047,322, hereafter Vaid)

12. For claim 21, Shaffer discloses a media device configured to transmit data streams at negotiated transfer rates, wherein a negotiated transfer rate is limited to bandwidth apportioned to one of a plurality of data classes for each data stream (col. 5 lines 43-45, adjusting coding algorithm to negotiated rate and transmitting at that rate)

allocating bandwidth to the data streams by negotiating a transfer rate for each of the plurality of data streams from a plurality of acceptable transfer rates, the plurality of acceptable transfer rates provided by plug-ins prior to transmitting each data stream at the negotiated transfer rate (col. 3 lines 6-34, col. 4 lines 21-32, audio, video coding provides acceptable transfer rates (or bandwidth per stream) for each type of traffic, col. 5 lines 10-21, plug-ins are coding algorithms provided to the user device, each algorithm has an associated rate).

Shaffer does not explicitly disclose:

each class of the plurality of data classes corresponds to a node in a hierarchical policy tree; detecte termination of a particular data stream; in response to detecting termination of the particular data stream, determine whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocate the bandwidth to the other data stream: (a) select an existing data stream based, within said hierarchical policy tree; and (b) increase the bandwidth allocated to said existing data stream.

However, Packer discloses:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree (col. 14 lines 40-51, classification tree for traffic classes, 3.2, policies);

detect termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream (col. 13 lines 45-60, col. 14 lines 7-10, excess information rate EIR allows freed bandwidth from a terminated flow to be reallocated to other flows, until demand is satisfied meaning no need for more bandwidth for other flows, based on bandwidth availability);

(a) select an existing data stream; and (b) increase the bandwidth allocated to said existing data stream (col. 11 line 39 to col. 12 line 16, bandwidth classification tree is an *N-ary tree with its nodes ordered by specificity*, each “tier" or layer in the tree corresponds is ordered to a *orthogonal paradigm* at a specificity level; col. 14 lines 32-37, soft isolation, free or unused bandwidth can be allocated or shared among *different* data classes).

Packer further discloses that unused bandwidth can be reallocated or redistributed on an “as available” basis, meaning as soon as a flow is terminated (col. 13 lines 40-43, col. 14 lines 7-10).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer and Packer to take advantage of available bandwidth

resources that has not been consumed by allocating excess bandwidth to data stream as available (Packer, col. 13 lines 41-43).

Shaffer-Packer does not disclose that the selecting is based, at least in part, on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree; and steps (a) and (b) are in response to detecting that no data stream from said particular class is able to use bandwidth that was allocated to the terminated data stream.

However, Vaid discloses that a user or administrator can determine how used bandwidth are typically shared among siblings of a same traffic class of a hierarchical bandwidth policy model (fig. 3) than among distant traffic classes (col. 6 lines 47-52).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer-Packer and Vaid in order to share unused bandwidth among siblings traffic flows first, then once siblings do not require more bandwidth, select another stream based on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree so that the unused bandwidth will be shared to other classes preferably close to the current class of the terminated flow, in order to efficiently utilize the unused bandwidth and easily allocate unused bandwidth to closest classes first.

13. For claim 24, Shaffer discloses a computer-implemented method for allocating bandwidth of a data network to a plurality of data streams, comprising:

specifying apportionment of the bandwidth to a plurality of data classes (col. 5 lines 55-59, voice and data bandwidth allocation);

receiving a plurality of data streams for a plurality of plug-ins; wherein each plug-in of the plurality of plug-ins is associated with a data class of the plurality of data classes (fig. 2, video, audio, data modules are plug-ins);

wherein each data stream is associated with one of the plurality of data classes (col. 3 lines 6-34, data stream inherently has information identifying whether it is audio, video or data);

from a plurality of acceptable transfer rates for each associated plug-in, negotiating a transfer rate for each data stream (fig. 2, col. 4 lines 41-63, each module negotiates which coding algorithm to use so that transfer rate is within thresholds);

wherein the transfer rate of the data stream for each plug-in is limited to the bandwidth apportioned to the data class associated with the particular plug-in (col. 5 lines 55-59, each stream transfer rate is limited by allocated rate of the class that the stream belongs); and

transmitting the data streams on the data network at the negotiated transfer rates (col. 5 lines 43-45, adjusting coding algorithm to negotiated rate and transmitting at that rate).

Shaffer does not explicitly disclose:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree; detecting termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream; performing the steps of (a) selecting an existing data stream based, within said hierarchical policy tree; and (b) increasing the bandwidth allocated to said existing data stream.

However, Packer discloses:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree (col. 14 lines 40-51, classification tree for traffic classes, 3.2, policies);

detecting termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream (col. 13 lines 45-60, col. 14 lines 7-10, excess information rate EIR allows freed bandwidth from a terminated flow to be reallocated to other flows, until demand is satisfied meaning no need for more bandwidth for other flows, based on bandwidth availability);

performing the steps of:

(a) selecting an existing data stream; and (b) increasing the bandwidth allocated to said existing data stream (col. 11 line 39 to col. 12 line 16, bandwidth classification

tree is an *N-ary tree with its nodes ordered by specificity*, each “tier" or layer in the tree corresponds is ordered to a *orthogonal paradigm* at a specificity level; col. 14 lines 32-37, soft isolation, free or unused bandwidth can be allocated or shared among *different* data classes).

Packer further discloses that unused bandwidth can be reallocated or redistributed on an “as available” basis, meaning as soon as a flow is terminated (col. 13 lines 40-43, col. 14 lines 7-10).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer and Packer to take advantage of available bandwidth resources that has not been consumed by allocating excess bandwidth to data stream as available (Packer, col. 13 lines 41-43).

Shaffer-Packer does not disclose that the selecting is based, at least in part, on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree; and steps (a) and (b) are in response to detecting that no data stream from said particular class is able to use bandwidth that was allocated to the terminated data stream.

However, Vaid discloses that a user or administrator can determine how used bandwidth are typically shared among siblings of a same traffic class of a hierarchical bandwidth policy model (fig. 3) than among distant traffic classes (col. 6 lines 47-52).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer-Packer and Vaid in order to share unused bandwidth

among siblings traffic flows first, then once siblings do not require more bandwidth, select another stream based on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree so that the unused bandwidth will be shared to other classes preferably close to the current class of the terminated flow, in order to efficiently utilize the unused bandwidth and easily allocate unused bandwidth to closest classes first.

Shaffer-Packer-Vaid further teaches the method is performed by one or more processors (Vaid, fig. 2, processor).

14. For claim 1, Shaffer discloses a method for allocating bandwidth of a data network to a plurality of data streams, comprising:

specifying apportionment of the bandwidth to a plurality of data classes (col. 5 lines 57-58, data and voice bandwidth apportionment, col.4 lines 45-48, fig. 4, 5, bandwidth threshold X, Y of traffics);

receiving a plurality of data streams (fig. 2, receiving video, audio or data traffics are classes);

determining a particular data classes that corresponds to a particular data stream, wherein one or more other data streams that are associated with the particular data class are currently being transmitted (col. 3 lines 5-25, col. 5 lines 10-20, each stream's class is recognized by available or supported audio, video coding algorithms, col. 5 lines 61-62, many streams in one class).

determining a plurality of acceptable transfer rates for the particular data stream, negotiating a transfer rate for the particular data stream from the plurality of acceptable transfer rates (col. 4 lines 21-32, col. 5 lines 10-20, audio, video coding algorithms provide acceptable transfer rates (or bandwidth per stream) for each type of traffic),

Wherein negotiating a transfer rate for the particular data stream includes selecting a transfer rate that

(b) does not cause the transfer rate of the one or more data streams to go below minimum acceptable transfer rates of the one or more other data streams (col. 6 lines 13-44, bandwidth is stepped up when current monitored rate falls below a threshold for all streams in a class); and

transmitting the particular data stream on the data network at the negotiated transfer rate (col. 5 lines 43-45, adjusting coding algorithm to negotiated rate and transmitting at that rate);

Shaffer does not explicitly disclose: the transfer rate (a) does not exceed bandwidth apportioned to the particular data class that is not being used by the one or more other data streams; each class of the plurality of data classes corresponding to a node in a hierarchical policy tree; detecting termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream; performing the steps of (a) selecting an existing data stream based, within

said hierarchical policy tree; and (b) increasing the bandwidth allocated to said existing data stream.

However, Packer discloses: the transfer rate (a) does not exceed bandwidth apportioned to the particular data class that is not being used by the one or more other data streams (excess bandwidth can be allocated to a flow based on available bandwidth or bandwidth that has not been consumed, col. 13 lines 38-60)

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree (col. 14 lines 40-51, classification tree for traffic classes, 3.2, policies);

detecting termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream (col. 13 lines 45-60, col. 14 lines 7-10, excess information rate EIR allows freed bandwidth from a terminated flow to be reallocated to other flows, until demand is satisfied meaning no need for more bandwidth for other flows, based on bandwidth availability);

performing the steps of:

(a) selecting an existing data stream; and (b) increasing the bandwidth allocated to said existing data stream (col. 11 line 39 to col. 12 line 16, bandwidth classification tree is an *N-ary tree with its nodes ordered by specificity*, each “tier" or layer in the tree corresponds is ordered to a *orthogonal paradigm* at a specificity level; col. 14 lines 32-

37, soft isolation, free or unused bandwidth can be allocated or shared among *different* data classes).

Packer further discloses that unused bandwidth can be reallocated or redistributed on an “as available” basis, meaning as soon as a flow is terminated (col. 13 lines 40-43, col. 14 lines 7-10).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer and Packer to take advantage of available bandwidth resources that has not been consumed by allocating excess bandwidth to data stream as available (Packer, col. 13 lines 41-43).

Shaffer-Packer does not disclose that the selecting is based, at least in part, on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree; and steps (a) and (b) are in response to detecting that no data stream from said particular class is able to use bandwidth that was allocated to the terminated data stream.

However, Vaid discloses that a user or administrator can determine how used bandwidth are typically shared among siblings of a same traffic class of a hierarchical bandwidth policy model (fig. 3) than among distant traffic classes (col. 6 lines 47-52).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer-Packer and Vaid in order to share unused bandwidth among siblings traffic flows first, then once siblings do not require more bandwidth, select another stream based on where the node that corresponds to the data class of

the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree so that the unused bandwidth will be shared to other classes preferably close to the current class of the terminated flow, in order to efficiently utilize the unused bandwidth and easily allocate unused bandwidth to closest classes first.

15. For claim 2, Shaffer-Packer-Vaid further discloses the step of receiving comprises steps of: receiving stream annotations associated with each of the data streams; using a stream annotation associated with the particular data stream to select a plug-in of a plurality of plug-ins; activating the plug-in to receive each data stream (Shaffer, fig. 2, col. 3 lines 6-33, audio, video inherently has annotations in the header identifying sender, receiver, protocol type, codec type, resolution, quality etc., a plug-in is a coding software for each stream such as codec)

16. For claim 4, Shaffer-Packer-Vaid further discloses the step of transmitting comprises steps of: transforming information content within the particular data stream to the negotiated transfer rate (Shaffer, col. 3 lines 6-34, coding is transforming); and transmitting the data stream on the data network at the negotiated transfer rate (Shaffer, col. 5 lines 43-45).

17. For claim 5, Shaffer-Packer-Vaid further discloses the step of transforming comprises a step of thinning, transcoding or decimating the particular data stream to the negotiated transfer rate (Shaffer, col. 3 lines 6-34, audio/video coding).

18. For claim 6, Shaffer-Packer-Vaid further discloses the transfer rate is a first transfer rate, the method further comprising steps of: determining an amount of unallocated bandwidth on the data network (Shaffer, col. 5 line 58-col. 6 line 2); negotiating a second transfer rate for a first data stream, wherein the second transfer rate uses the unallocated bandwidth (Shaffer, col. 6 line 25-35, increasing bandwidth usage by using more bandwidth-required coding due to available bandwidth); transforming the first data stream to the negotiated second transfer rate; and transmitting the first data stream on the data network at the second transfer rate (Shaffer, col. 6 lines 34-35).

19. For claim 7, Shaffer-Packer-Vaid further discloses steps of: receiving a second data stream; determining a second data class that corresponds to the second data stream; negotiating a third transfer rate for the first data stream, wherein the third transfer rate is limited to the bandwidth apportioned to the second data class; negotiating a fourth transfer rate for the second data stream, wherein the fourth transfer rate is limited to the bandwidth apportioned to the second data class; and transmitting on the data network, the first data stream at the third transfer rate and the second a second data stream at the fourth transfer rate (Shaffer, col. 5 line 22-col. 6 line 34, the

second data stream and first data stream can just belong to a same class and their transfer rates can be adjusted to a third and forth transfer rate dynamically according to bandwidth threshold and maximum bandwidth of their class).

20. For claim 22, Shaffer discloses a system for allocating bandwidth of a data network to a plurality of data streams, comprising:

One or more processors (fig. 3, processor 302);

Means, operatively coupled to the one or more processors, for specifying apportionment of the bandwidth to a plurality of data classes (col. 5 lines 57-58, data and voice bandwidth apportionment, col.4 lines 45-48, fig. 4, 5, bandwidth threshold X, Y of traffics);

means, operatively coupled to the one or more processors, for receiving a plurality of data streams (fig. 2, receiving video, audio or data traffics are classes);

means, operatively coupled to the one or more processors, for determining a particular data class that corresponds to a particular data stream (col. 3 lines 5-25, col. 5 lines 10-20, each stream's class is recognized by available or supported audio, video coding algorithms, col. 5 lines 61-62, many streams in one class);

means, operatively coupled to the one or more processors, for determining a plurality of acceptable transfer rates for the particular data stream (col. 3 lines 6-34, codecs for a plurality of available transmission rates for a audio/video flow);

means, operatively coupled to the one or more processors, for negotiating a transfer rate for the particular data stream, wherein the transfer rate is a selected one of

the plurality of acceptable transfer rates (col. 3 lines 6-34, col. 4 lines 21-32, audio, video coding provides acceptable transfer rates (or bandwidth per stream) for each type of traffic);

Shaffer does not explicitly disclose:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree; means, operatively coupled to the one or more processors, for detecting termination of a particular data stream; means, operatively coupled to the one or more processors, for determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream in response to detecting termination of the particular data stream, and if so, allocating the bandwidth to the other data stream; means, operatively coupled to the one or more processors, for performing the steps of (a) selecting an existing data stream based, within said hierarchical policy tree; and (b) increasing the bandwidth allocated to said existing data stream.

However, Packer discloses:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree (col. 14 lines 40-51, classification tree for traffic classes, 3.2, policies);

means, operatively coupled to the one or more processors, for detecting termination of a particular data stream; means, operatively coupled to the one or more processors, for determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream in response to

detecting termination of the particular data stream, and if so, allocating the bandwidth to the other data stream (col. 13 lines 45-60, col. 14 lines 7-10, excess information rate EIR allows freed bandwidth from a terminated flow to be reallocated to other flows, until demand is satisfied meaning no need for more bandwidth for other flows, based on bandwidth availability);

means, operatively coupled to the one or more processors, for performing the steps of:

(a) selecting an existing data stream; and (b) increasing the bandwidth allocated to said existing data stream (col. 11 line 39 to col. 12 line 16, bandwidth classification tree is an *N-ary tree with its nodes ordered by specificity*, each “tier" or layer in the tree corresponds is ordered to a *orthogonal paradigm* at a specificity level; col. 14 lines 32-37, soft isolation, free or unused bandwidth can be allocated or shared among *different* data classes).

Packer further discloses that unused bandwidth can be reallocated or redistributed on an “as available” basis, meaning as soon as a flow is terminated (col. 13 lines 40-43, col. 14 lines 7-10).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer and Packer to take advantage of available bandwidth resources that has not been consumed by allocating excess bandwidth to data stream as available (Packer, col. 13 lines 41-43).

Shaffer-Packer does not disclose that the selecting is based, at least in part, on where the node that corresponds to the data class of the existing data stream is, within

the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree; and steps (a) and (b) are in response to detecting that no data stream from said particular class is able to use bandwidth that was allocated to the terminated data stream.

However, Vaid discloses that a user or administrator can determine how used bandwidth are typically shared among siblings of a same traffic class of a hierarchical bandwidth policy model (fig. 3) than among distant traffic classes (col. 6 lines 47-52).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer-Packer and Vaid in order to share unused bandwidth among siblings traffic flows first, then once siblings do not require more bandwidth, select another stream based on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree so that the unused bandwidth will be shared to other classes preferably close to the current class of the terminated flow, in order to efficiently utilize the unused bandwidth and easily allocate unused bandwidth to closest classes first.

21. For claim 23, Shaffer discloses a computer-implemented method for allocating bandwidth of a data network to a plurality of data streams, comprising:

apportioning the bandwidth to a plurality of data classes (col. 5 lines 57-58, data and voice bandwidth apportionment, col.4 lines 45-48, fig. 4, 5, bandwidth threshold X, Y of traffics);

receiving a plurality of data streams each associated with one of the plurality of data classes (fig. 2, receiving video, audio or data traffics are classes);

from a plurality of acceptable transfer rates, negotiating a transfer rate for each data stream, wherein the transfer rate is limited to the bandwidth apportioned to the data class associated with each data stream (col. 4 lines 21-32, col. 5 lines 10-20, audio, video coding algorithms provide acceptable transfer rates (or bandwidth per stream) for each type of traffic); and

transmitting the data streams on the data network at the negotiated transfer rates (col. 5 lines 43-45, adjusting coding algorithm to negotiated rate and transmitting at that rate);

Shaffer does not explicitly disclose:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree; detecting termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream; performing the steps of (a) selecting an existing data stream based, within said hierarchical policy tree; and (b) increasing the bandwidth allocated to said existing data stream.

However, Packer discloses:

each class of the plurality of data classes corresponding to a node in a hierarchical policy tree (col. 14 lines 40-51, classification tree for traffic classes, 3.2, policies);

detecting termination of a particular data stream; in response to detecting termination of the particular data stream, determining whether another data stream from said particular data class is able to use bandwidth that was allocated to the terminated data stream, and if so, allocating the bandwidth to the other data stream (col. 13 lines 45-60, col. 14 lines 7-10, excess information rate EIR allows freed bandwidth from a terminated flow to be reallocated to other flows, until demand is satisfied meaning no need for more bandwidth for other flows, based on bandwidth availability);

performing the steps of:

(a) selecting an existing data stream; and (b) increasing the bandwidth allocated to said existing data stream (col. 11 line 39 to col. 12 line 16, bandwidth classification tree is an *N-ary tree with its nodes ordered by specificity*, each “tier" or layer in the tree corresponds is ordered to a *orthogonal paradigm* at a specificity level; col. 14 lines 32-37, soft isolation, free or unused bandwidth can be allocated or shared among *different* data classes).

Packer further discloses that unused bandwidth can be reallocated or redistributed on an “as available” basis, meaning as soon as a flow is terminated (col. 13 lines 40-43, col. 14 lines 7-10).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer and Packer to take advantage of available bandwidth

resources that has not been consumed by allocating excess bandwidth to data stream as available (Packer, col. 13 lines 41-43).

Shaffer-Packer does not disclose that the selecting is based, at least in part, on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree; and steps (a) and (b) are in response to detecting that no data stream from said particular class is able to use bandwidth that was allocated to the terminated data stream.

However, Vaid discloses that a user or administrator can determine how used bandwidth are typically shared among siblings of a same traffic class of a hierarchical bandwidth policy model (fig. 3) than among distant traffic classes (col. 6 lines 47-52).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Shaffer-Packer and Vaid in order to share unused bandwidth among siblings traffic flows first, then once siblings do not require more bandwidth, select another stream based on where the node that corresponds to the data class of the existing data stream is, within the hierarchical policy tree, relative to where the node of the class of the terminated data stream is, within said hierarchical policy tree so that the unused bandwidth will be shared to other classes preferably close to the current class of the terminated flow, in order to efficiently utilize the unused bandwidth and easily allocate unused bandwidth to closest classes first.

Shaffer-Packer-Vaid further teaches the method is performed by one or more processors (Vaid, fig. 2, processor).

## *Conclusion*

22. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on 571-272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HH

/Kenny S Lin/

Primary Examiner, Art Unit 2452